Abstract of the Disclosure

Unnecessary barrier instructions are dynamically reduced in a parallel processing object program, program module or object code section to be parallel processed in a multiprocessor system by a compiler that generates the parallel processing object program from a source program. The compiler divides the source program into parallel processing objects, issues a pre dynamic barrier instruction having parameters for barrier necessity determination that describe a first variable or array memory reference in the parallel processing object, which includes a parallel processing loop. In addition, the compiler issues a post dynamic barrier instruction having information in parameters about a second variable or array (or group of arrays) to be referenced after the parallel processing object. A dynamic barrier executing device uses a hardware system for checking for a data dependency between the first and second variable or array references to reduce unnecessary barrier instructions based on the parameters of the pre and post dynamic barrier instructions.